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Indian Standard

GENERAL INTRODUCTION FOR MILLING MACHINES WITH TABLE OF VARIABLE HEIGHT, WITH HORIZONTAL OR VERTICAL SPINDLE

UDC 621·914·32

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

May 1993

Price Group 3

Machine Tool Basics and Modular Units Sectional Committee, PE 03

NATIONAL FOREWORD

This Indian Standard which is identical with ISO 1701-0 : 1984 'Test conditions for milling machines with table of variable height, with horizontal or vertical spindle — General introduction' issued by the International Organization for Standardization (ISO), was adopted by the Bureau of Indian Standards on the recommendations of the Machine Tool Basics and Modular Units Sectional Committee (PE 03) and approval of the Production Engineering Division Council.

The text of the ISO standard has been approved as suitable for publication as Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard'.

b) Only the English language text of the International Standard has been retained while adopting it as Indian Standard.

In the adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards which are to be substituted in their place, are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 1984-0 : 1984 Test conditions for milling machines with table of fixed height, with horizontal or vertical spindle — Part 0 : General introduction	IS 13640 : 1993 General introduction for milling machines with table of fixed heights, with horizontal or vertical spindle	Identical
ISO 3855 : 1977 Milling cutters — Nomenclature	IS 1830 : 1982 Technical supply conditions for equivalent milling cutters (*second revision*)	Technically equivalent

The Indian Standards, IS 2200 : 1973 Test chart for milling machines with table of variable height with horizontal spindle and IS 2201 : 1973 Test charts for milling machines with table of variable height with vertical spindle (*both under revision*) are adjuncts to this standard.

Indian Standard

GENERAL INTRODUCTION FOR MILLING MACHINES WITH TABLE OF VARIABLE HEIGHT, WITH HORIZONTAL OR VERTICAL SPINDLE

1 Scope and field of application

This part of ISO 1701 defines the machining processes that can be carried out on milling machines with table of variable height with horizontal or vertical spindle, and describes the different types of machines.

Milling machines with table of fixed height are covered by ISO 1984.

This part of ISO 1701 also gives a nomenclature for the main elements of the machine.

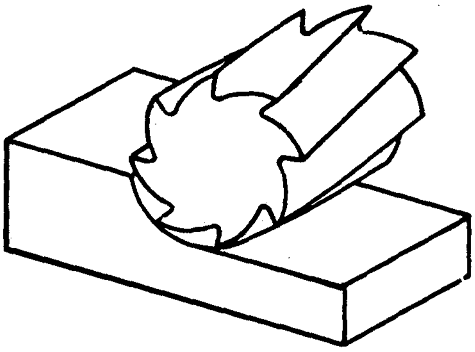

Figure 1 — Slab milling operation

2 References

ISO 1984/0, *Test conditions for milling machines with table of fixed height, with horizontal or vertical spindle — Part 0 : General introduction.*

ISO 3855, *Milling cutters — Nomenclature.*

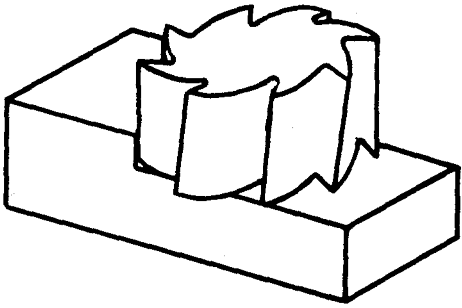

Figure 2 — Face milling operation

3 Definitions of the machining processes that can be carried out

3.1 Milling operations

Milling is a machining operation which consists of removing material by means of a rotary tool called a "milling cutter" of which there are several different types.

The usual operations of milling can be divided into three categories :

- slab milling operations (see figure 1);
- face milling operations (see figure 2);
- end milling operations (see figure 3).

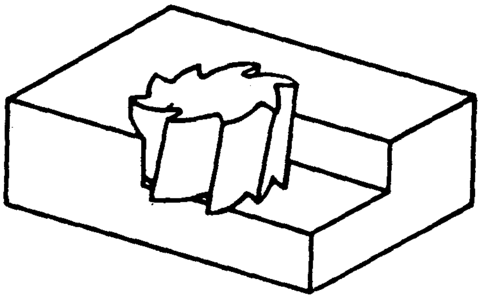

Figure 3 — End milling operation

3.2 Other operations

In addition to normal milling operations as described in 3.1, other operations such as boring and metal slitting (by the use of a metal slitting saw) may be carried out on milling machines.

4 Description of machines

In milling machines with table of variable height with horizontal or vertical spindle, the base-plate is rigidly fixed to the column (see figures 4, 5 and 6).

In this type of machine, the cutting movement is given by the spindle, the axis of which is horizontal or vertical.

The feed movements are as follows :

4.1 Spindle with a horizontal axis (see figure 4)

- the X axis of motion constitutes the longitudinal movement of the table;

- the Y axis of motion constitutes the vertical movement of the table;

- the Z axis of motion is parallel to the spindle axis and constitutes the transverse movement of the table.

4.2 Spindle with a vertical axis (see figure 5)

- the X axis of motion constitutes the longitudinal movement of the table;

- the Y axis of motion constitutes the transverse movement of the table;

- the Z axis of motion is parallel to the spindle axis and constitutes the vertical movement of the spindle head;

- the W axis of motion constitutes the vertical movement of the table.

4.3 Movable head with horizontal or vertical spindle axis (see figure 6).

- the X axis of motion constitutes the longitudinal movement of the table;

- the Y axis of motion constitutes the transverse movement of the table;

- the Z axis of motion constitutes the vertical movement of the table.

NOTE — All these feed movements may be carried out by a rapid traverse of the element in question.

5 Nomenclature

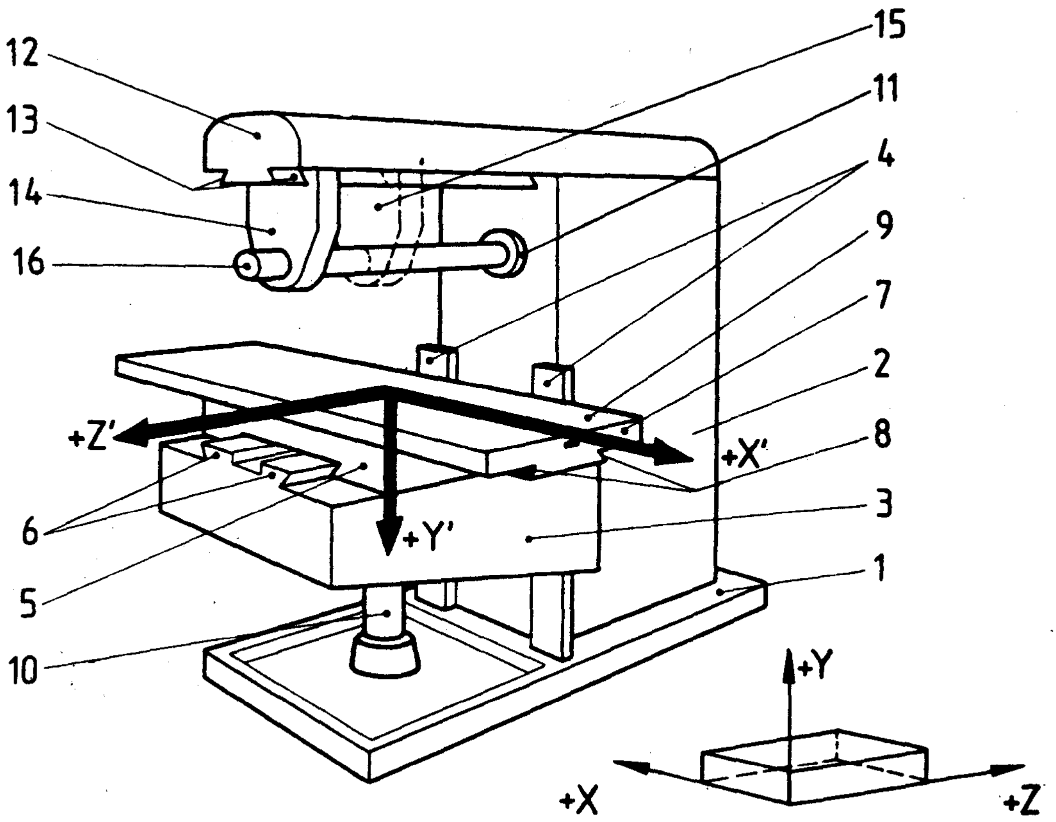

Figure 4 — Milling machine with table of variable height, with fixed horizontal spindle

Ref.	Designation
	English
1	Base-plate with tray
2	Column
3	Knee
4	Knee slideways
5	Saddle
6	Saddle slideways
7	Table
8	Table slideways
9	Table surface
10	Vertical feed-screw
11	Spindle nose
12	Overarm
13	Overarm slideways
14	Front arbor support
15	Rear arbor support
16	Arbor

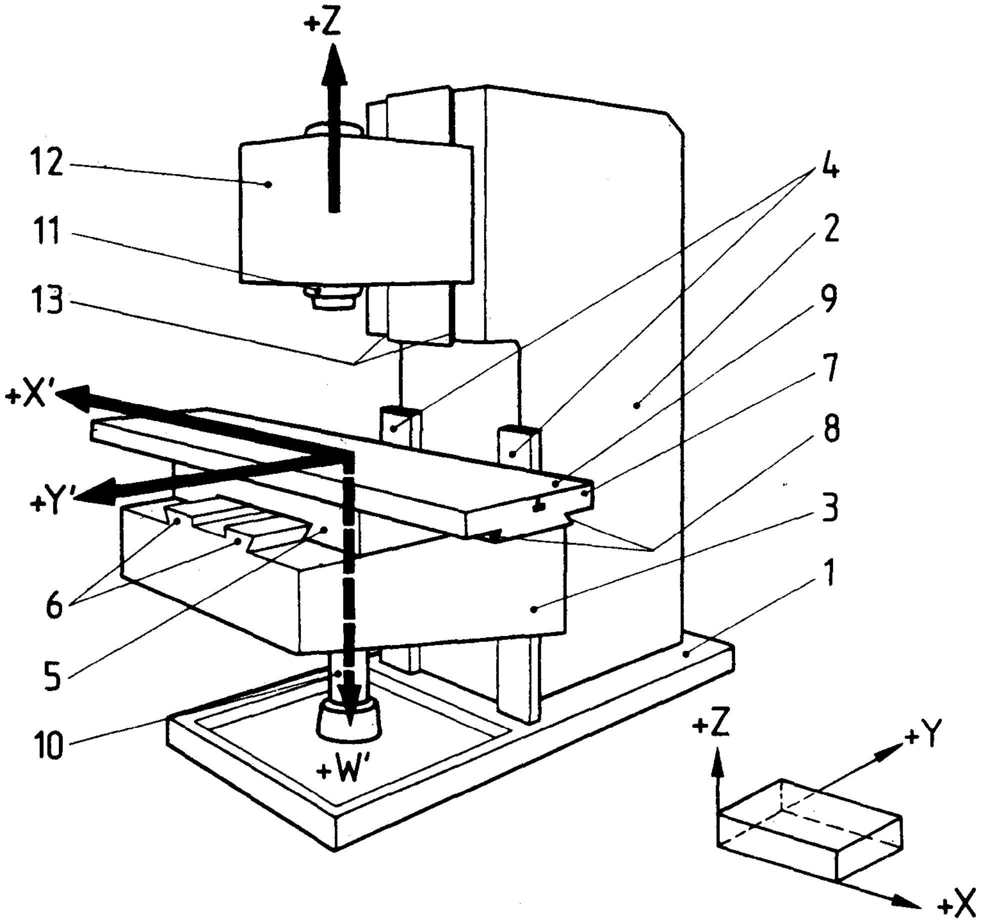

Figure 5 — Milling machine with table of variable height, with vertical spindle and a sliding vertical saddle spindle head

Ref.	Designation
	English
1	Base-plate with tray
2	Column
3	Knee
4	Knee slideways
5	Saddle
6	Saddle slideways
7	Table
8	Table slideways
9	Table surface
10	Vertical feed-screw
11	Spindle nose
12	Spindle head
13	Spindle head slideways

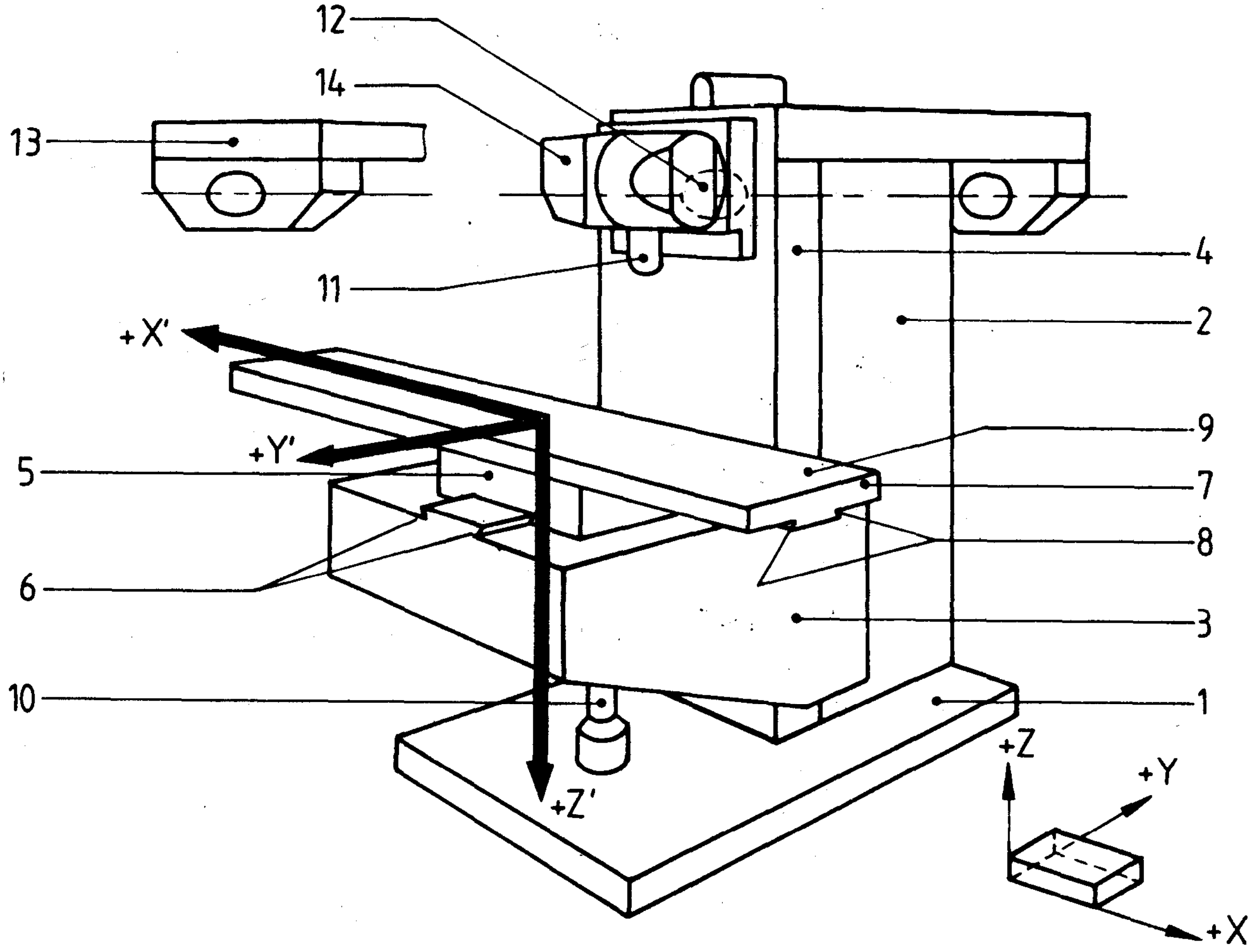

Figure 6 — Milling machine with table of variable height, with a movable head, with horizontal or vertical spindle

Ref.	Designation
	English
1	Base-plate with tray
2	Column
3	Knee
4	Knee slideways
5	Saddle
6	Saddle slideways
7	Table
8	Table slideways
9	Table surface
10	Vertical feed-screw
11	Vertical spindle nose
12	Horizontal spindle nose
13	Horizontal milling attachment
14	Movable head

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Amend No.	Date of Issue	Text Affected

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